PATENT APPLICATION

RESPONSE UNDER 37 C.F.R. §1.116
EXPEDITED PROCEDURE
TECHNOLOGY CENTER ART UNIT 1775

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Mark Henry SHIPTON et al. Group Art Unit: 1775

Application No.: 10/676,042 Examiner: A. AUSTIN

Filed: October 2, 2003 Docket No.: 117313

For: METHOD OF FORMING A DIFFUSION BARRIER ON A METALLIC SUBSTRATE

REQUEST FOR RECONSIDERATION UNDER 37 C.F.R. §1.116

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In reply to the November 3, 2006, Office Action, reconsideration of the rejection is respectfully requested in light of the following remarks.

Claims 1-7 and 15-18 are pending in this application.

Claims 1-7 and 15-18 are rejected under 35 U.S.C. §103(a) as being obvious over Deakin et al. (WO 94/18359) ("Deakin") in view of Sangeeta (U.S. Patent No. 6,395,406) ("Sangeeta"). Applicants respectfully traverse the rejection.

The Examiner asserted that Deakin discloses forming an intermetallic diffusion barrier, such as a platinum aluminide barrier, on a titanium substrate by sequential deposition of metallic layers, e.g., platinum layer followed by an aluminum layer (Abstract). Deakin specifically describes deposition of the metallic layers in Example 1 by RF-biased DC sputtering. Formation of the diffusion barrier occurs in an inert vacuum environment by

applying heat at a "sufficiently high temperature to initiate the exothermic reaction necessary to form the intermetallic species" (Office Action, p. 3). The Examiner acknowledged that Deakin "does not disclose the use of an organic carrier or the temperature range" set forth in the claims (Office Action, p. 3).

To remedy the defects of Deakin, the Examiner cited Sangeeta and asserted that this reference discloses methods of making platinum-aluminum barrier coatings on metal surfaces, including titanium substrates. The coating is in the form of a slurry applied to the surface, which is then heated. Although Applicants do not dispute the fact that Deakin discloses coating a slurry on a substrate, Applicants respectfully disagree with the Examiner regarding the heating step. Deakin discloses coating a surface and then heating the coated surface at a first temperature sufficient to remove most of the volatile slurry components, e.g., 100-400°C, *followed by* heating the coated surface at a second temperature sufficient to form the platinum aluminide coating, e.g., 800 to 1200°C (col. 7, lines 25-30). In other words, the first heating step is performed to evaporate a portion of the volatile material of the organic carrier, but it is the second heating step at the higher temperature range that is the reacting step. Evaporating (or drying) does not equate to reacting. Thus, Sangeeta fails to teach or even suggest heating the substrate *to form a diffusion barrier thereon* at, or even close to, the temperature range required in the claimed method.

Moreover, one of ordinary skill in the art would not be motivated by Sangeeta or any reference to reduce the Deakin "exemplary" 750°C temperature to obtain a less volatile product (Office Action, p. 5). First, the goal of Deakin is to promote a chemical reaction by imparting sufficient energy to the platinum-aluminum mixture on the substrate. *See, e.g.,* Deakin, p. 3, last paragraph. By lowering the temperature as contended by the Examiner, the result would be a less volatile platinum-aluminum mixture on the substrate, but *not* a diffusion barrier. Second, the Examiner asserted that Deakin discloses an "exemplary"

temperature. In other words, Deakin discloses a model or typical temperature. In view of the disclosure of a model or typical temperature *effectively* used to prepare a metallic diffusion barrier on a substrate, one of ordinary skill in the art would have no motivation to change that temperature.

The Examiner also cited Sangeeta to establish the alleged obviousness of using an organic carrier for the platinum and aluminum materials disclosed by Deakin. However, obviousness cannot be established by picking and choosing individual teachings from the applied references. Each reference must be viewed in its entirety. In this case, once viewed in their entireties, it is clear that there is no motivation, teaching or suggestion to combine Deakin and Sangeeta. More specifically, Deakin discloses preparing a metallic coating using DC sputtering - a technique that employs the potential difference between materials to transfer atoms of the desired material, whereas Sangeeta discloses preparing a metallic coating using metallic particles in an organic carrier. The two techniques have nothing in common that enable elements of one technique to be incorporated into the other technique. Hence, one of ordinary skill in the art would not have found it obvious to combine the teachings of the two references to arrive at the claimed method.

Clearly, none of the applied references, alone or in combination, discloses or suggests a method of forming a platinum-aluminide diffusion barrier on a titanium alloy substrate that includes applying to the substrate a coating comprising particulate platinum and particulate aluminum in an organic carrier, and performing a reaction treatment at a temperature ranging from about 200°C to about 600°C, as recited in independent claim 1. Thus, reconsideration and withdrawal of the rejection are respectfully requested.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-7 and 15-18 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,

James A. Oliff
Registration No. 27,075

Kristin K. Vidovich
Registration No. 41,448

JAO:KKV/hs

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OLIFF & BERRIDGE, PLC
P.O. Box 19928
Alexandria, Virginia 22320
Telephone: (703) 836-6400

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